PATENT SPECIFICATION

703,599

Date of Application and filing Complete Specification: June 26, 1952.

No. 16053/52.

Complete Specification Published: Feb. 3, 1954.

Index at acceptance:—Class 34(1), D(1A: 8J).

COMPLETE SPECIFICATION

A Dryer System, for Drying Cellulosic Seamless Casing or Tube

I, HUGH SPARKES, 52, Fairfax Road, Bath Road Estate, Bridgwater, Somerset, a British subject, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

My invention relates to an improvement of the known method for continually drying a cellulosic seamless casing or tube, in which the cellulosic casing or tube is inflated during the process of drying, so as to remove creases and the like. According to my invention the casing is expanded by pure oxygen to ensure that the inner side of the casing is hygenically clean, and not subject to foreign substances which might be blown in from the ordinary compressor air line, even if that air be filtered. Therefore, by using pure oxygen, it renders the cellulosic casing suitable for universal use, e.g., as sausage skins.

The cellulosic casing having been expanded to the required diameter, within the limits of a "steam heated dryer unit" (shown at "Z," Fig. 1) is allowed to travel through the dryer by mechanical movement and thence in a dried condition to a take off spool situated at one end of the drying machine. At the feed end of the machine, and before the wet casing is passed between the feed rollers at "A" Fig. 1, it must be loaded with a fluid sealing substance equal to the requirements of the substance of the cellulosic casing. The operation of the sealing fluid is to ensure that all perforations which may have occurred during the manufacture of the casing, are sealed during the process of drying. The inflating of the casing takes place before it enters the rollers at "B" Fig. 1. The Oxygen has now become locked within the limits of the dryer Fig. 1 at "A" and "B" and remains so for any required period.

When the machine is set in motion, the rollers at "B" Fig. 1 perform the actual work of pulling the cellulosic casing "Z" through the dryer, at the same time pushing the oxygen back through the casing on to Roller "A." As the now flattened casing moves forward to the take off spool in a continuous movement, so the oxygen is squeezed back through the casing on to—but not beyond roller "A."

Letter K.1. Fig. 1 shows the steam inlet, letter K.2. shows the condensate outlet. In order that my invention, and the manner of performing the same, may be properly understood, I herewith append two sheets of explanatory drawings to be hereinafter referred to in describing my invention.

Fig. 1 shows a sectional view of the steam operated dryer, the sections take the form of fabricated steel sections flanged at each end and constructed to form a steam jacket dryer of any desired length, the two end sections to have blanked ends. By cutting slots in the said flanges of each section shown at "F" Fig. 3, provision has been made to allow the steam to circulate throughout the entire length of the steam jacket dryer, when constructed as shown in Fig. 1. The steam jacket dryer when fully assembled, is mounted on an angular bed or the like and supported by four small rollers to each section, two at each side. The rollers on this particular design are meant to serve a double purpose. (1) To allow for expansion and contraction of the steam jacket under working temperatures. (2) To enable the operators to trolley the sections about when the machine is pulled down for cleaning or the like.

The drying jacket when mounted on its bed, is held in a firm position by two strong spring buffers anchored at each

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Price 4s 6d

end of the machine which equalizes the movement of the steam jacket when under working temperature, the spring buffers are not shown on the drawings.

The purpose for which the dryer has been designed, is to dry a cellulosic seamless casing or tube free from creases or the like by the application of radiant heat facilitated by air introduced through the circular jets "D" Fig. 4.

Fig. 2 shows the exposed side of the dryer at "C." "D" is a hollow circular air jet which has around its inner perimeter two rows of spray holes "E" set at the angle of 135° away from each other.

The circular jets are placed in position at each of the flanged joints "G" throughout the entire length of the inner side of the steam jacket dryer. A special feature of the air jets is to support the casing "Z" Fig. 1 while travelling through the dryer, the air emitted from the jets "D" Fig. 4 permit the cellulosic casing to travel along the whole length of the dryer, centred and cushioned within a cone of air. The pressure of air passing from the jets "D" Fig. 4, must not however, be excessive but at such a value as not to cause indentation to the cellulosic casing during the drying operation. The casing in this manner passes through the entire length of the drying machine with the minimum amount of friction on its outer surface. The exhaust air from the jets "D" Fig. 4, after facilitating the drying process, is drawn off with the vapour and waste heat by a suction fan through the duct "H" Fig. 2. Air to the circular jets "D" Fig. 2 is delivered through the pipe "I" which is linked to the jets through the cut-away part of the flange shown at "J" Fig. 3.

Fig. 3 shows the end elevation of a section of the fabricated steel steam jacket dryer, with details of the steam ports "F" cut in the flange showing how, when the flanges of each section are bolted together, provision is made for the circulation of the steam throughout the whole of the dryer unit, maintaining the uniform temperature necessary to produce radiant heat for the purpose of drying the cellulosic seamless casing "J" Fig. 3, shows the cut-away portion of the flange to permit entry of the air pipe "I" "M" shows the inspection cover hinged to each sectional unit. "D" Fig. 3, shows elevation of air jet resting on four bosses on the inner side of the steam jacket, secured in position by lock nuts screwed over the pipe "I."

Fig. 4 shows the hollow circular jet "D" which has around its inner perimeter two rows of spray holes "E" set at the angle of 135° away from each other.

Fig. 6 and 8 show the mechanically driven squeeze rollers "A" and "B" made from suitable rubber material. The power to the rollers is transmitted through suitable reduction gears from a small motor. The motors "L" must be linked so that they give co-ordination of drive, to prevent drag on the casing during the process of drying.

Figs. 6 and 8 also show the method by which the spring pressure is evenly maintained on the rollers. The hand wheel "N" operates the shaft "O" which has a right and left-hand thread, which in turn operates two sliding wedge-shaped blocks "S" and "T." These move inwards and outwards, between upper and lower support beams. As the wedge-shaped blocks "S" and "T" move outwards from the centre of the beams "V" and "U," the lower beam "U" being a loose member is forced downwards and exerts a pressure on the compression springs and rollers at "Q" Fig. 8. Attached to the wedge-shaped compressing blocks are two small levers the other end of which are connected to a twin crank which operates a poundage dial calibrated in lbs. per square inch.

By referring to letters "S" and "G" Fig. 7, it will be seen that as the wedge-shaped blocks move to compress the rollers, a rotary pull is placed upon the twin cranks "X" which move the dial finger registering the poundage as shown in Fig. 7. Fig. 8 shows formation and method of construction of the compression springs.

Fig. 5 shows the roller bearings.

What I claim is:—

1. A method of continually drying cellulosic seamless casing or tube including inflating the tube for the purpose of removing creases or the like, by a continuous mechanical process in which the tube is expanded by pure oxygen.

2. A method according to Claim 1 in which the cellulosic casing is guided and supported throughout the dryer by a series of circular air jets, each jet giving off a double spray of air around the outer perimeter of the cellulosic casing or tube.

3. A method as set forth in Claims 1 and 2, the dryer being fitted with two sets of mechanically driven squeeze rollers constructed and operated substantially as herein described and illustrated in the accompanying drawings.

H. SPARKS.

Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press.—1954.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

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2 SHEETS

This drawing is a reproduction of the Original on a reduced scale.

SHEET 1

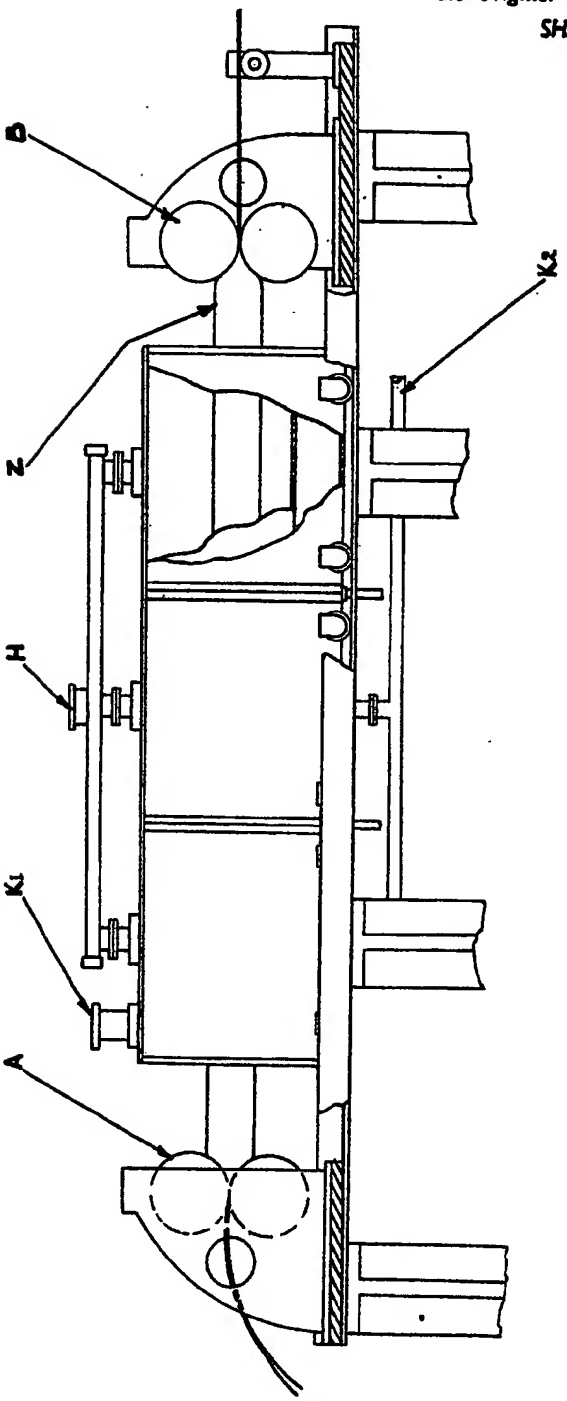

FIGURE 1

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2 SHEETS

This drawing is a reproduction of the Original on a reduced scale.

SHEET 2

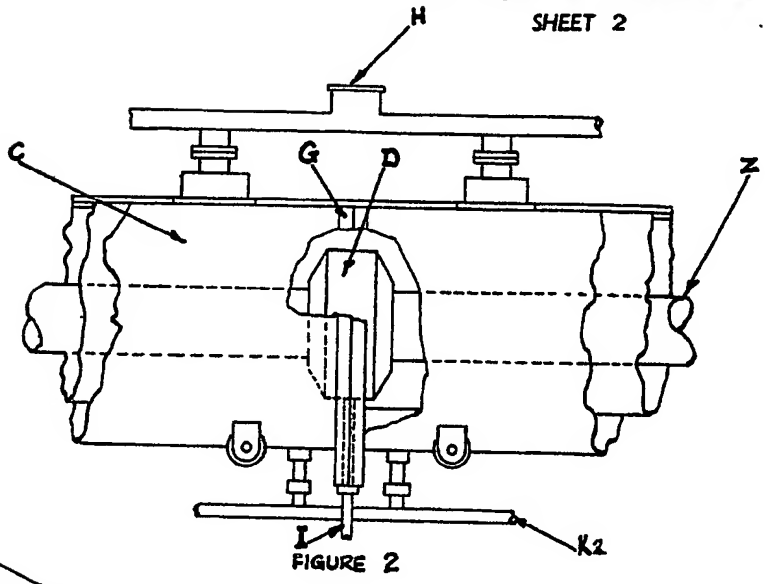

FIGURE 2

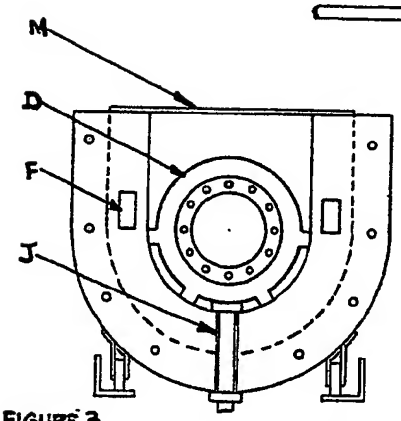

FIGURE 3

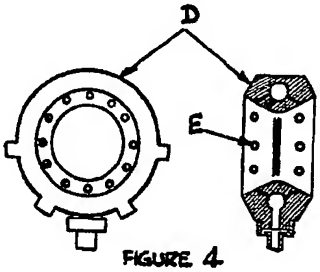

FIGURE 4

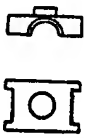

FIGURE 5

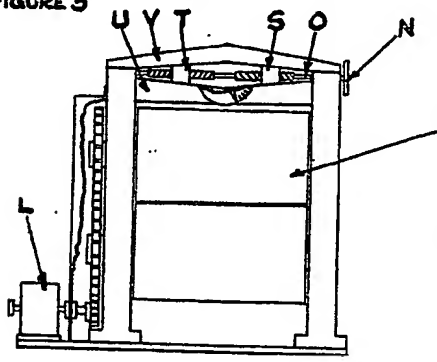

FIGURE 6

FIGURE 8

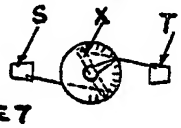

FIGURE 7